UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

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MEMORANDUM FOR: F - William T. Hogarth, Ph.D.

FROM: F/SE - Roy E. Crabtree, Ph.D.

SUBJECT: Request for Declaration of a Fishery Resource Disaster Pursuant to Section 312(a) of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) -- ISSUES ADVISORY

This is to advise you of issues regarding the subject action.

BACKGROUND

In a letter to Secretary Evans, dated December 11, 2002, Georgia Governor Roy Barnes requested the declaration of a fisheries resource disaster pursuant to Section 312(a) of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA)(16 U.S.C. 1861a) for the commercial blue crab fishery in Georgia. The request was prompted by the "unprecedented decline in the abundance of blue crabs" in Georgia coastal waters. According to Governor Barnes' letter, reported landings of hard blue crabs declined to record lows during the past two years (2001 and 2002). The average of commercial landings of hard blue crabs in 2001 and 2002 was 69% below the historical average (1985-2002). Governor Barnes' request states that poor catches over the last four years have resulted in approximately $2 million of lost income for Georgia blue crab fishers. The Governor's letter also states that the majority of commercial crab fishers prefer direct financial assistance to mitigate the effects of their lost income.

Section 312(a) of the MSFCMA , entitled "Fisheries Disaster Relief" states, "At the discretion of the Secretary or at the request of the Governor of an affected State or a fishing community, the Secretary shall determine whether there is a commercial fishery failure due to a fishery resource disaster as a result of natural causes, man-made causes beyond the control of fishery managers to mitigate through conservation and manage measures, or undetermined causes."

ECONOMIC CONSIDERATIONS

The Georgia Department of Natural Resources (GADNR) provided commercial landings data for blue crabs for the period of 1985 through 2002. This information showed that landings from 1985 through 1997 averaged 7,597,000 pounds per year and that the lowest landings level was in 1987 when 6,256,000 pounds were harvested. In 1998 landings only reached 5,038,000 pounds and

landings declined steadily to 2,702,000 pounds in 2001. From 1998-2001 average landings were 3,710,750 pounds per year. This represents a 52% decline from the historical average. For 2002 landings were 1,833,000 pounds. The data for 2002 was not complete when the GADNR submitted this information but it is believed that the final numbers will be very close to the preliminary figure. Using 2002 data would have demonstrated an even greater economic loss but since the information is not yet final it was not used in any loss calculations.

The GADNR provided information on the ex-vessel value of the blue crab landings for each year. Based on this information, the average ex-vessel value for all blue crab landings from 1985 through 1997 was $2,902,976 per year. From 1999 through 2001, the average ex-vessel value was $2,306,679 per year. That's an average yearly loss of $596,297. Over the four-year period of 1998 through 2001 Georgia blue crab fishers lost $2,385,188. This value does not reflect any loss by others involved with the fishery (e.g., processors), nor does it represent the total economic impact to the fishing community.

In 1995, a commercial crabbing license was created by the Georgia General Assembly and was required in 1996. Eligibility criteria, including proof of crab sales for the period from 1993 to 1994, had to be met before an individual was issued a license. During the period from 1995 to 1998, these eligibility criteria were further refined so that, by 1999, only those individuals who sold crab during the three-year moratorium were allowed to purchase a commercial crab license. A total of 159 individuals qualified for a license. That year the Georgia General Assembly determined that a maximum of 159 licenses could be issued. Using the four-year loss calculated above and dividing it by the number of licensed commercial crab fishers yields an average loss of approximately $15,000 over the four-year period of 1998-2001. This loss represents an average 20% decrease in income for each licensed blue crab fisher over the 1998-2001 time period.

STATUS OF THE FISHERIES RESOURCES

The GADNR has conducted a Shrimp Assessment Survey (SAS) for over 30 years. This assessment is conducted in six Georgia estuarine systems, with different water bodies (classified as creeks, sounds and offshore) sampled in each system. Each month a total of 36 sites are sampled. This assessment study was designed to monitor shrimp populations but also provides information on blue crab abundance. The following is based on the SAS database summaries for the years 1985 through 2001.

From 1985 through 1997, the average number of adult blue crabs caught per year was 1,932 with an average of 890 adults caught from 1998 through 2001. This represents a decrease of 54%. Likewise, average sublegal (subadult) blue crab catch from 1985 through 1997 was 2,323 per year while the average for 1998 through 2001 was 698. This represents a 70% decrease. Although catch figures for 2002 were not used for any loss calculations, it is illustrative to note that the adult catch for 2002 was 130 (a 93% decrease) and the sublegal catch was 104 (a 95% decrease).

A possible cause for this substantial decline in the blue crab population is the combined effects of drought conditions and an increase in the parasitic dinoflagellate, *Hematodinium perez*. Since

1998 a persistent drought has occurred in Georgia. Corresponding to this drought is a significant rise in salinity in the creeks and sounds. Salinity in creeks has increased an average of 17.8% and the salinity in sounds is up an average of 14.6%. The indigenous dinoflagellate, *Hematodinium perez*, has apparently flourished in the more saline waters found in the estuaries during the prolonged drought. This dinoflagellate is a parasite of blue crabs and attacks the oxygen carrying hemolymph, effectively suffocating the infected individual. *Hematodinium* has been found to be 100% lethal once contracted and infection rates as high as 40% of crabs within a given estuary have been observed in recent years. Dr. Richard Lee, of the Skidaway Institute of Oceanography, describes *Hematodinium's* effects on blue crab populations in his paper "Where Have the Blue Crabs Gone? Evidence for A Drought Induced Epizootic." Dr. Lee's work clearly suggests the parasitic dinoflagellate, *Hematodiniun,* has played a prominent role in the decline in the blue crab population size by increasing mortality rates in Georgia's blue crab stock.

Furthermore, diminished freshwater inflow allows seawater to penetrate further into the estuary thereby displacing blue crabs beyond historical, and oftentimes legal, fishing grounds. Displacement of crabs may result in the population being in areas of unsuitable and/or reduced habitat. Also, it is possible that reproductive success has been compromised due to recruitment failure. Higher salinity may cause mature females to release their eggs in the creeks and sounds and not near inlets. Eggs require salinity of 23-30 ppt for hatching. Optimum salinity for larval development is 30 ppt at 25 °C. Larvae require clean, non-turbid, high salinity water for development. These conditions usually exist only in open Atlantic Ocean waters seaward of the estuaries – an area to which gravid females typically move under normal conditions. If eggs are released in the estuary proper, then it is likely that larval survival will be poor.

CONCLUSIONS

Commercial blue crab fishers of Georgia have been economically impacted during the 1998-2001 seasons. Blue crab populations have declined significantly since 1998. Blue crab landings have also declined markedly and have reached all time lows the last two years (2001 and 2002). Based upon data supplied by the GADNR, it is estimated that commercial blue crab harvesters lost $2,385,188 from 1998 through 2001.

Governor Barnes asked that assistance be provided under authority of Section 312(a) of the MSFCMA. According to the wording of the MSFCMA, the Secretary must determine that a commercial fisheries failure occurred and that it resulted from a fishery resource disaster. There is substantial evidence that natural causes, including drought-induced higher salinities and an increased incidence of the parasitic dinoflagellate, *Hematodinium perez*, have brought about a substantial decline (54%-70% decrease) in the population of blue crabs in Georgia waters, resulting in a fishery resource disaster. Blue crab landings have also significantly declined (52% decrease) and with them considerable income for blue crab fishers (a four-year loss of $2,385,188), bringing about a commercial fishery failure.